

Appl. No. 09/927,244
Amdt. dated September 16, 2003
Reply to Office Action of 06/16/03

PATENT

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings of claims in the application:

Please amend the claims as indicated below.

1. (Currently Amended) A substrate processing chamber having at least one component bearing a rare earth-containing coating bound to a parent material by an intervening oxide adhesion layer, such that the component exhibits resistance to etching in a plasma environment.

2. (Original) The substrate processing chamber of claim 1 wherein said rare earth-containing coating is selected from the group of Yttrium fluoride, Yttrium oxides, Yttrium-containing oxides of Aluminum, Erbium oxides, and Neodymium oxides.

3. (Currently Amended) The substrate processing chamber of claim 1 wherein the component is selected from the group ~~comprising~~ consisting of a chamber liner, a chamber dome, a chamber wall, a cover plate, a gas manifold, a faceplate, a substrate support, and a substrate support/heater.

4. (Currently Amended) The substrate processing chamber of claim 1 wherein the adhesion layer comprises a graded subsurface layer of rare earth oxide material formed in the surface of the parent material.

5. (Currently Amended) The substrate processing chamber of claim 4 wherein the adhesion layer comprises a subsurface rare earth oxide layer resulting from a changed energy of bombardment during introduction of rare earth material into the parent material through an IBA process.

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6. (Currently Amended) The substrate processing chamber of claim 4 wherein the adhesion layer comprises a subsurface rare earth oxide layer resulting from a changed implantation energy during introduction of rare earth material into the parent material through a MEPIID process.

7. (Original) The substrate processing chamber of claim 1 wherein the parent material comprises aluminum nitride or aluminum oxide.

8. (Withdrawn) A method for treating a parent material for corrosion resistance to plasma comprising:

forming an adhesion layer over a parent material; and
forming a rare earth-containing coating over the adhesion layer.

9. (Withdrawn) The method of claim 8 wherein the rare earth-containing coating is formed by deposition of rare earth-containing material.

10. (Withdrawn) The method of claim 9 wherein rare-earth ions are introduced by conducting reactive sputter deposition in an oxygen-containing ambient.

11. (Withdrawn) The method of claim 8 wherein the adhesion layer is formed by introducing rare earth metals into the parent material at varying energies to form a graded implant layer.

12. (Withdrawn) The method of claim 11 wherein the adhesion layer is formed by an ion bombardment assisted deposition (IBAD) technique employing bombardment of a deposited rare earth layer with inert Argon ions at changed energies.

13. (Withdrawn) The method of claim 11 wherein the adhesion layer is formed by accelerating rare-earth ions at the parent material at changed energies of implantation.

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14. (Withdrawn) The method of claim 13 wherein rare-earth ions are accelerated using a MEPIIID ion implanter.

15. (Withdrawn) A method for treating a parent material for corrosion resistance to plasma comprising:

forming an adhesion layer over a parent material; and

forming a rare earth-containing coating over the adhesion layer by exposing a rare earth present on a surface of the parent material to a fluorine ambient.